

THESIS/REPORTS
TERRELL, T. T.

LIBRARY
FOREST BIOLOGY LABORATORY
VICTORIA, B.C.

Library
(NOT FOR PUBLICATION)

US
FS
IFRES
Misc
17

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE
OGDEN, UTAH

REED W. BAILEY, DIRECTOR

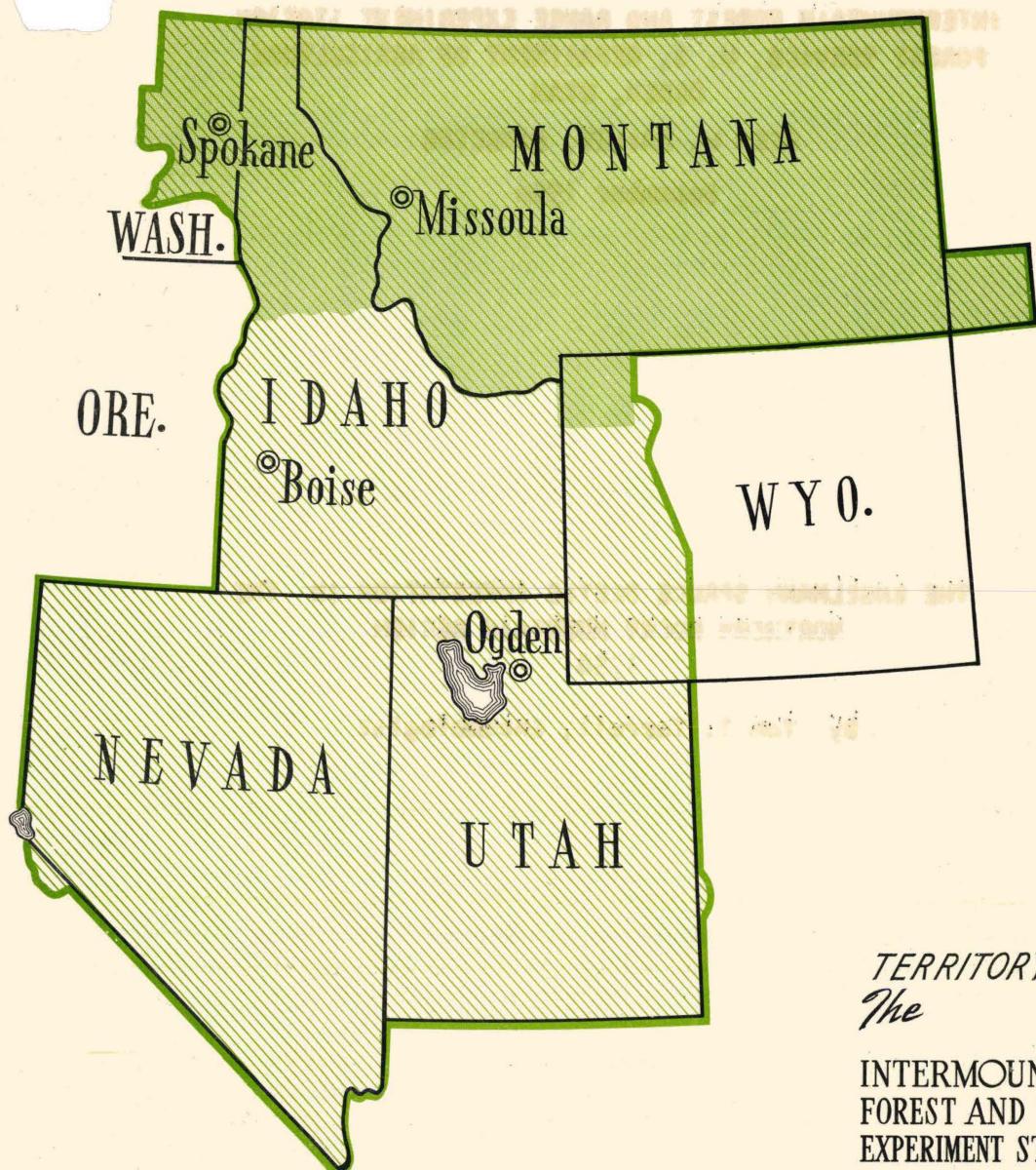
December 1956

THE ENGELMANN SPRUCE BEETLE INFESTATION IN THE
NORTHERN ROCKY MOUNTAIN REGION
1956

By Tom T. Terrell, Entomologist

Prepared by the
Missoula Forest Insect Laboratory
Missoula, Montana

The AREA COVERED BY THIS REPORT



TERRITORY OF..
The

INTERMOUNTAIN
FOREST AND RANGE
EXPERIMENT STATION

The MISSOULA FOREST INSECT LABORATORY
is a field unit of the Intermountain Forest and
Range Experiment Station at Ogden, Utah. The
Laboratory conducts forest insect research, surveys
forest insect outbreaks, and gives technical advice
on cooperative insect control programs in Montana,
northwestern South Dakota, northwestern Wyoming,
northern Idaho, and northeastern Washington.

The functions are conducted in the remaining
station territory by staff entomologists at Ogden,
and Boise, Idaho.



THE ENGELMANN SPRUCE BEETLE INFESTATION IN THE
NORTHERN ROCKY MOUNTAIN REGION

1956

By Tom T. Terrell, Entomologist

During the period 1952 through 1956 an Engelmann spruce beetle^{1/} outbreak in northern Idaho and western Montana caused heavy losses in the Engelmann spruce stands. The outbreak developed when great hoards of the bark beetles emerged from windthrown trees and attacked spruce stands throughout the area. More than 400 national forest compartments were declared to be epidemically infested. In 1953 the outbreak reached its climax when over 800 million board feet of spruce was attacked. A decline in the outbreak was first noticed in 1954 and further reductions occurred in 1955 and 1956 (table 1).

Table 1.--Estimated Engelmann spruce volume killed by the Engelmann spruce beetle by years in the northern Rocky Mountain region

1952	- - - - -	617	million ft. bm.
1953	- - - - -	881	" " "
1954	- - - - -	590	" " "
1955	- - - - -	332	" " "
1956	- - - - -	165	" " "

Of the estimated $2\frac{1}{2}$ billion board feet attacked by the beetle during this five-year period, about 25 percent has been logged for beetle control or salvage purposes. Although the outbreak is subsiding, logging of the beetle-killed trees will undoubtedly continue for several years.

In the initial period of the Engelmann spruce beetle outbreak, the Missoula Forest Insect Laboratory (then a field station of the Bureau of Entomology and Plant Quarantine at Coeur d'Alene, Idaho) carried on a program of both aerial and ground detection and appraisal surveys. The survey requirements were of such a magnitude, however, that most of the ground work was done by national forest administrative personnel. The Laboratory eventually directed its efforts more toward surveys designed to record the natural trend of the outbreak. Selected areas in which no chemical or logging control was expected and which were felt to be representative of the region were surveyed annually.

1/ Dendroctonus engelmanni Hopk.

The outbreak trend surveys were initiated in 1954. Data taken during 1954 included records of the then current infestation and the beetle-caused timber damage for the 2-year period of 1952-1953. At the time of the 1954 surveys the beetle-killed trees that had been attacked in 1952 and 1953 could not be readily separated. However, from areas previously surveyed during both these years, the ratio of infested volume, on a regionwide basis, was 1.9 in 1953 to 1.0 in 1952. This ratio has been used in table 2 to allocate the combined loss data for the 1952-1953 period into each of the two years.

Originally, 27 separate areas were surveyed for the purpose of checking the infestation trend. Some of these areas were dropped in 1955 to improve the proportion of areas by degree of infestation and distribution; others were dropped from the list when logging was initiated in them. Again in 1956, it was found that several more of the original areas were being logged. Only 8 of the areas were felt to be useful for checking the trend of the Engelmann spruce beetle infestation in 1956 (table 2). Although these eight areas are few in number they are felt to be fairly representative of the region as a whole.

The data given in table 2 show that the beetle infestation has decreased on a regionwide basis since 1953. It has also decreased in 6 of the 8 areas during the same period. Generally speaking, the decreases have been most marked where the original outbreak was very heavy and more gradual where the 1952 infestation was light. In fact, the only significant increases since 1953 were in lightly infested areas. The course of the outbreak can be readily followed in table 2 in the line entitled "Index of Change". Here, using the average board-foot volume killed in 1952 as index 1, the comparable losses in succeeding years is given.

These data and the data in table 1 show the decline of the Engelmann spruce beetle outbreak to a near endemic point on a regionwide basis. While there is evidence that the outbreak as a whole has run its course, there are "spot" infestations of limited acreage that are still active.

Table 2.--Average percentage of the initial spruce volume killed annually by the Engelmann spruce beetle on typical uncontrolled areas

<u>Infested area</u>	<u>Acres</u>	<u>1952</u> ^{1/}	<u>1953</u> ^{1/}	<u>1954</u>	<u>1955</u>	<u>1956</u>
COLVILLE NATIONAL FOREST						
Upper Salmo River	1,715	2.8	5.3	4.4	.7	.9
GLACIER NATIONAL PARK						
McDonald Creek	4,200	10.4	19.8	18.5	8.3	1.0
FLATHEAD NATIONAL FOREST						
Kletomus Creek	1,100	1.7	3.3	1.7	2.3	0.3
Piper Creek	862	2.6	5.0	5.1	1.6	0.2
Soup Creek	990	2.9	5.6	0.5	0.4	0.0
KOOTENAI NATIONAL FOREST						
Porcupine Creek	600	5.3	10.1	22.7	7.2	2.9
S. Fk. Keeler Creek	1,300	20.1	38.2	19.4	.9	.2
LOLO NATIONAL FOREST						
Selway-Bitterroot Wilderness Area	1,700	7.2	13.8	11.2	10.5	4.2
Total	12,467					
Averages		7.9	15.0	12.8	5.0	1.4
Index of change		1.0	1.9	1.6	.6	.2

^{1/} The sum of 1952 and 1953 killed volumes have been allocated by years on the ratio of 1.0 to 1.9, respectively